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Prescriber Algorithm

Evolution and Enhancements

January 2013

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Overview of Prescriber Algorithm Evolution

- **In the process of enhancing the prescriber algorithm several drug, metric and methodology enhancements were made**
    - The driving force behind the updates were increased understanding of high risk prescriber behavior based on store investigation feedback, numerous pharmacy panels, additional time to conduct analytical deep dives, and corporate executive guidance
- **These enhancements, in combination, increased the flagged prescribers from 72 to 138, and separated them into tiers**
    - The net result of all of the changes calibrated the model most closely to previously identified prescribers and DEA/CVS suspended/flagged prescribers without including thousands of additional prescribers
- **The continuous item across both algorithms has been the expectation that all flagged prescribers with be reviewed with a high level of diligence prior to being actioned**

2

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Algorithm changes – metric related changes

Opportunity/ Enhancement	Justification/ Reasoning	Interim	Enhanced
Added additional metrics that were recognized as being important to identifying bright line behaviors	• The plan from the beginning was to included additional metrics once they were developed; preliminary algorithm did not included them due to time constraints • Align with store algorithm	• Volume • Share • Cash • Age • Relative Cash • Relative Age • Relative travel	███████████
Modifications to age, cash, and travel metric definition based on enhanced understanding of risky behaviors	• Updated understanding of risky ranges for age and travel and use of better definition for cash • RPh panel feedback • Align with store algorithms	███████████	███████████
Modifications to relative/"unexplained" red flag metrics based on cleaner sample of "non controlled" population	███████████	███████████	███████████

3

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Algorithm changes – drug related changes

Opportunity/ Enhancement	Justification/ Reasoning	Interim	Enhanced
Update drug list to be more representative of recognized problem drugs	• RPh panel feedback • Feedback from store teams during store investigations • DEA/Media	▉	▉
Break out problem drugs into separate algorithms	• RPh panel feedback • Feedback from store teams during store investigations • Align with store algorithm	One algorithm with 5 equally weighed drugs	▉
Remove cough syrups with hydrocodone as they were artificially causing non-problematic doctors to flag	• Conversations with prescribers and additional analysis • RPh feedback	Cough syrups with hydrocodone included (1mg=1 dosage)	▉

4

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Algorithm changes – methodology related changes

Opportunity/ Enhancement	Justification/ Reasoning	Interim	Enhanced
Benchmark period updated to include cleaner specialty data	• Older benchmark period was discovered to have a large number of issues with the prescriber specialty data; since December of 2011 the data began undergoing cleanup	Data ran for Oct 2011-Feb 2012 but benchmark set for Mar 2010-Jan 2012	Data and benchmark ran for Mar 2012-Aug 2012
Thresholds for red flag metrics adjusted to capture only the top tier prescribers	• Updated understanding of "bright line" behaviors from store investigations and RPh panels • Push-back / fear of media repercussions due to possible false identifications	Cash and age threshold = top 10% Relative cash, age and travel = top 50%	All metrics = top 5%
Change in methodology from Grouping method to counts method due to inclusion of additional red flag metrics	• Additional metrics necessitated change in methodology • Using count method calibrated the algorithm most closely to suspended/flagged prescribers without including thousands of prescribers above the bright line	Grouping method: Volume and share thresholds with at least one "disproportionate" red flag and at least one "unexplained" red flag	Counting method: Volume and share thresholds with at number of additional red flags relative to the volume and share
Tiering system added	• Due to methodology changes and tightening of metrics, the number of flagged prescribers decreased, tier 2 added to include additional group of doctors that likely necessitate investigation	Above of below the bright line	Tier 1 = immediate review/ action Tier 2 = secondary review/action

5

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Sample changes between algorithms

Initial Algorithm

6

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Sample prescriber who flagged on initial algorithm but would not flag on enhanced algorithm

If we filter the algorithm for any family practice doctor with oxycodone volume and share about the 91st and 69th percentiles respectively with one red flag, 228 family practice doctors would flag for oxycodone prescribing

7

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Sample prescriber who flagged on both algorithms

Doctor Brown flags for tier 2 for Hydrocodone Based on 95th plus percentile for volume and share with 5 red flags

8

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Sample prescriber who flags on enhanced algorithm but not initial algorithm

███████████████ flags on tier 1 for oxycodone prescribing; he just missed the cutoff for being above the bright line in the initial algorithm

9

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APPENDIX

10

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Current data for Dr. Gabbay

Although he does not flag for the updated time period, his percentiles for hydrocodone are borderline. This data combined with the additional information provided during outreach, his suspension seems justified

11

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